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| IO/580,336 | 05/24/2006 | Shun Takahashi | ITO-105-PCT | 5569 |
| 77464 | 7590 | 01/19/2011 | EXAMINER | |
| IPUSA, P.L.L.C 1054 31ST STREET, N.W. Suite 400 Washington, DC 20007 | | | NERANGIS, VICKEY MARIE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1762 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/580,336

Applicant(s)

TAKAHASHI ET AL.

Examiner

Vickey Nerangis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-25 and 27-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-25 and 27-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. All outstanding rejections, except for those maintained below, are withdrawn in light of applicant's amendment filed on 11/9/2010.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
3. The new grounds of rejection set forth below are necessitated by applicant's amendment filed on 11/9/2010. In particular, claims 22 and 27 have been amended to include specific layered silicates and claims 31-34 are new. Thus, the following action is properly made final.

Claim Rejections - 35 USC § 103

4. Claims 22-25 and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohanty (US 2003/0216496) in view of Suzuki (US 6,583,208), Swor (US 5,494,955), and Gardner (US 6,210,614)

Mohanty discloses a polylactic acid-based nanocomposite (paragraph 0059) that is prepared by extrusion and compression molding (see figures 1-4) comprising PLA (paragraph 0023) and clay which is organic modified into an organoclay and dispersed into the polymer (paragraph 0061). Mohanty also teaches the use of a coupling agent to improve the clay-polymer matrix adhesion (paragraph 0061).

Mohanty fails to disclose (i) an organoclay (i.e., organically modified layered silicate) that is functionalized with a silyl group, (ii) that the clay comprises silanol groups on the surface, or (iii) that the clay is one of kanemite, makatite, magadite, or kenyaite.

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With respect to (i), Suzuki discloses a polyester resin composition having improved flexural modulus of elasticity, flexural strength, deflection temperature under load, and dimensional stability comprising a thermoplastic polyester resin and a silane-treated phyllosilicate which is treated with Y_nSiX_{4-n} , wherein $n = 0-3$, Y is a hydrocarbon group having 1-15 carbon atoms such as alkyl (col. 7, line 73) and can be substituted with an amide group (col. 7, line 26), and X is a hydrolysable group such as amino and/or a hydroxyl group (col. 7, line 12-47).

Given that Mohanty discloses the use of a coupling agent and further given that Suzuki teaches that treating phyllosilicate with a silane like claimed provides for improved combination of properties, it would have been obvious to one of ordinary skill in the art to utilize the silane treatments of Suzuki in the nanocomposite of Mohanty.

With respect to (ii), Swor discloses that a coupling agent reacts with the silanol groups on the surface of silicates and clays (col. 3, lines 36-46).

Given that Mohanty discloses that the clays are modified with a silane coupling agent like Swor, it would have been obvious to one of ordinary skill in the art to utilize a clay with a silanol groups so that it can interact with the coupling agent.

With respect to (iii), Mohanty teaches the use of organoclays such as montmorillonite and Suzuki teaches other suitable clays including saponite, hectorite, “and the like” that are swellable phyllosilicate (col. 6, lines 1-5).

Gardner discloses a rigid substrate that comprises a thermoplastic and nanoparticles and teaches that nanoparticles can be derived from layered silicate minerals such as montmorillonite, hectorite, saponite, kanemite, magadite, and kenyaite (col. 19, lines 1-23).

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Given that both Mohanty and Suzuki are open to the use of swellable silicates to form nanoparticles and further given that such nanoparticles can also be prepared from kanemite, magadite, and kenyaite as taught by Gardner, it would have been obvious to one of ordinary skill in the art to utilize other swellable layered silicate minerals as taught by Gardner in the nanocomposite taught by Mohanty and Suzuki. Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

Double Patenting

5. Claims 22-25 and 27-34 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/628,625 (published as US 2008/0069993). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons given below.

US appl. '625 claims a biodegradable gas barrier container comprising polylactic acid and a phyllosilicate to which a substituted silyl group having a substituted or unsubstituted alkyl group is bonded. On pages 9-10 of the specification of US appl. '625, the substituted silyl group is described as, inter alia, be substituted with hydroxyl and amino groups and unsubstituted or substituted alkyl groups having 3-20 carbon atoms and the phyllosilicate is selected from kanemite, makatite, magadiite, or kenyaite. Case law holds that those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an

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invention claimed in the patent. In re Vogel, 422 F.2d 438, 164 USPQ 619,622 (CCPA 1970).

Therefore, it would have been obvious to one of ordinary skill in the art to prepare a resin composition with a phyllosilicate that is kanemite, makatite, magadiite, or kenyaite comprising a substituted silyl group like claimed.

Response to Arguments

Applicant's arguments filed 11/9/2010 have been fully considered but they are not persuasive. Specifically, applicant argues (A) that none of Mohanty, Suzuki, or Swor discloses phyllosilicate that is kanemite, makatite, magadiite, or kenyaite and (B) that the provisional obviousness-type double patenting rejection should be withdrawn because the instant application is earlier filed.

With respect to argument (A), the new grounds of rejection set forth above further in view of Gardner includes the newly claimed types of phyllosilicate.

With respect to argument (B), even though the instant application is filed before US appl. '625, it is appropriate to reject the instant claims given that neither application is in condition for allowance. As stated in MPEP 804(I)(B), "[t]he provisional double patent rejection should continue to be made by the examiner in each application as long as there are conflicting claims in more than one application unless that 'provisional' double patenting rejection is the only rejection remaining in at least one of the applications." Especially since there is not a double patenting rejection over the instant application in US appl. '625, the rejection is properly rejected.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Nerangis whose telephone number is (571) 272-2701. The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

vn

/Vickey Nerangis/
Primary Examiner, Art Unit 1796